Milestone Report

for Upland Source Control at the Portland Harbor Superfund Site

December 2009

Prepared by the Oregon Department of Environmental Quality

State of Oregon Department of Environmental Quality

This document is posted on DEQ's web page at
http://www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/jointsource.htm.

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1.0 Introduction

On December 1, 2000, a section of the lower Willamette River within the City of Portland, the Portland Harbor, was added to the Superfund National Priority List (NPL). In February 2001, the Oregon Department of Environmental Quality (DEQ), United States Environmental Protection Agency (EPA), and other governmental parties[1] signed a Memorandum of Understanding (MOU) that provided a framework for cooperation in the investigation and cleanup of the Portland Harbor Superfund Site to optimize federal, state, tribal and trustee expertise and available resources.

Under the 2001 MOU, EPA was designated as the Lead Agency for investigating and cleaning up "in-water" contamination in the Harbor, i.e., contamination in the river water and underlying sediment using federal Superfund authorities. DEQ, using state cleanup authority, was designated as the Lead Agency for identifying and controlling "upland" sources of contamination, i.e., those sources of pollution adjacent to or near the river that may be contaminating river water or sediments. To coordinate in-water cleanup and upland source control work, the MOU directed DEQ and EPA to jointly develop a source control strategy that defines a process for identifying and controlling potential sources of contamination threatening the river.

DEQ and EPA finalized the Portland Harbor Joint Source Control Strategy (JSCS) in December 2005[2]. The overarching goal of the JSCS is to identify, evaluate and control sources of contamination that may affect the Willamette River in coordination with the objectives and schedule for the Portland Harbor remedial investigation and feasibility study (RI/FS). Upland source control is necessary to allow cleanup of the river to proceed without risk of significant recontamination. DEQ is currently implementing the JSCS in the Portland Harbor Superfund Site study area – approximately River Mile 1.9 to River Mile 11.8[3].

The JSCS requires DEQ to prepare a Milestone Report on a quarterly basis that summarizes the status of DEQ's upland source control work. The report submittal schedule has been changed to bi-yearly. This is the eighth Milestone Report. Milestone Reports are submitted to EPA, and provide the basis for potential meetings with EPA and our government partners to discuss site prioritization and source control progress. These reports also serve as documentation of progress on river-wide source control within Portland Harbor.

1.1 Organization of the Milestone Report

[1] The signatory partners to the MOU include the EPA, DEQ, Confederated Tribes and Bands of the Yakama Nation, Confederated Tribes of the Grand Ronde Community of Oregon, Confederated Tribes of Siletz Indians, Confederated Tribes of the Umatilla Indian Reservation, Confederated Tribes of the Warm Springs Reservation of Oregon, Nez Perce Tribe, National Oceanic and Atmospheric Administration, Oregon Department of Fish and Wildlife, and U.S. Department of the Interior.

[2] The JSCS is available on DEQ's web site at http://www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/jointsource.htm

[3] "River Mile" indicates the distance from the Willamette River's confluence with the Columbia River (i.e., River Mile 11.8 is 11.8 miles upstream of the confluence).

The Milestone Report is organized as follows.

- Section 2.0: Identifying Potential Sources of Contamination in Portland Harbor – This section describes DEQ's work to identify potential sources of contamination to the Willamette River in Portland Harbor, including site discovery and site assessment activities.
- Section 3.0: Evaluating Potential Sources of Contamination to the River – This section describes DEQ's status and schedule for the evaluation of all confirmed or suspected upland sources of contamination to Portland Harbor, as summarized in Table 1.
- Section 4.0: Taking Measures to Control Sources and Making Source Control Decisions – This section describes the source control measures used at upland sites in Portland Harbor and the process for making source control decisions, including coordination with EPA and our government partners, and public involvement opportunities. Source control measures and decisions are summarized in Table 1.
- Section 5.0: Status of Ongoing and Completed Source Control Activities – This section describes the information presented in Table 1 that summarizes the status of ongoing and completed source control measures. This section also describes the specific status of the 16 High Priority and Preliminary High Priority sites (Table 2). This section also presents five specific source control goals designed to help DEQ focus our efforts to achieve the overarching goal of source control.
- Section 6.0: Issues Encountered in Source Control Work – This section describes issues affecting DEQ's ability to conduct source control work and identifies paths forward towards resolution.
- Section 7.0: Summary – This section summarizes the overall status of source control work in Portland Harbor, highlighting accomplishments, key issues and next steps for moving forward.
- Section 8.0: Obtaining Additional Information on Upland Source Control Work – This section indicates where additional information can be found on the status of source control work at upland sites in Portland Harbor.
- Section 9.0: Information on Table 1: Controlling Confirmed or Suspected Upland Sources of Contamination to Portland Harbor – This section provides helpful information for interpreting Table 1, including definition of key terms and acronyms used.

2.0 Identifying Potential Sources of Contamination in Portland Harbor

DEQ's strategy for identifying and investigating potential sources of contamination to Portland Harbor prior to the December 2000 Superfund Site listing was described in the March 2006 Milestone Report. Those site identification and investigation activities were initially focused on a six-mile stretch of the lower Willamette River (now known as the Initial Study Area) extending from the southern tip of Sauvie Island upstream to Swan Island, from approximately River Mile 3.5 to River Mile 9.2. For more information, please see the March 2006 Milestone Report or please contact DEQ's Portland Harbor project manager, Jim Anderson at (503) 229-6825 or anderson.jim@deq.state.or.us

2.1 Recent Site Discovery and Site Assessment activities

As would be expected, DEQ's site discovery/site assessment activities have trickled off now that we've reached an intermediate stage of the upland source control effort and the significant sources are being addressed. This is not to say that additional site discovery work won't be necessary, it simply means that we are currently directing our energy toward completing site investigations and source control measures at existing Environmental Site Information Cleanup (ECSI) sites.

There are two main efforts that will help shape DEQ's future site discovery activities. One is the review of the Lower Willamette Group's (LWG) Draft Risk Assessment and Remedial Investigation documents. It's possible that information from these documents could identify specific areas where additional source identification is warranted.

The second effort is being undertaken by the City. In 2009, the City undertook a comprehensive evaluation of stormwater and sediment trap data collected from City outfall basins to evaluate potential source tracing needs and help shape future data collection objectives. The evaluation included data collected by the City as well as data collected by the LWG and Port of Portland in support of the in-water Remedial Investigation. This report will be submitted to DEQ in January 2010. A preliminary review of the findings generally supports the City's and DEQ's belief that all major sources within City outfall basins have been identified. However, the results also indicate that additional investigation may be warranted in a small number of basins where slightly elevated concentrations of certain contaminants could not be explained by the known sources/land uses in those basins.

<u>Collaboration with the City of Portland</u>

DEQ continues to work collaboratively with the City to identify and evaluate stormwater discharges under the Joint Source Control Strategy. DEQ is working closely with the City of Portland to identify upland sources contributing contamination via both the City's municipal stormwater system and private stormwater systems. Specifically, DEQ and the City collaborate to address upland stormwater discharges to the municipal system through:

- The Intergovernmental Agreement (IGA) between DEQ and the City's Bureau of Environmental Services (BES), to identify, investigate, and control contaminant discharges to shared city stormwater conveyance lines. The information collected under the IGA will be used as the foundation of the City's Remedial Investigation of its stormwater conveyance system and as the basis for DEQ's Programmatic Stormwater Management Plan for Portland Harbor. The City continues its efforts to identify potential contaminant sources by collecting solids and/or stormwater samples from stormwater pipes from select locations within their stormwater system. Examples of sites that have been recently identified using the City's source investigation data under the IGA include:
    - Calbag Nicolai in Basin 16
    - PacifiCorp Albina Substation in Basin 44
    - Air Liquide in Basin 22B
    - Metro in Basin 22B

- The Memorandum of Agreement (MOA) between DEQ and BES, that authorizes BES to administer DEQ issued National Pollutant Discharge Elimination System (NPDES) 1200-Z and 1300-J Industrial Stormwater General Permits for those facilities located with the City of Portland that discharge to the City's shared stormwater system or directly to surface water. City stormwater inspection activities were coordinated with DEQ project managers and in basins where DEQ site discovery may be needed (e.g., River Mile 11E, Basin 52).

- The City's NPDES Municipal Separate Storm Sewer System (MS4) Permit (#101314) issued by DEQ. The City's comprehensive stormwater management program includes numerous elements to reduce the discharge of pollutants into the Willamette River and other receiving waters. Key elements implemented under the City's stormwater plan include: development standards (e.g., 2008 Stormwater Management Manual); industrial and commercial controls; illicit discharge controls; structural controls; operations and maintenance; planning/system preservation and development; and public involvement and education.

- The City's *2008 Stormwater Management Manual* which outlines the City's stormwater management requirements that apply to all development and redevelopment projects within the City of Portland on both private and public property. The manual emphasizes the use of vegetated surface facilities to treat and infiltrate stormwater on the property where the stormwater runoff is created. Infiltrating stormwater onsite with vegetated surface facilities provides a number of benefits, including pollution reduction, volume and peak flow reduction, and groundwater recharge. The City contacts DEQ when permits are initiated on ECSI cleanup sites regarding potential stormwater management issues.

River Mile 11-East Focused Stormwater Investigation

Round 3 Portland Harbor sediment data collected by the Lower Willamette Group identified sediments contaminated by polychlorinated biphenyls (PCBs) in the River Mile (RM) 11-11.8 east area. Our current conceptual model is that the sediment contamination is largely due to past releases from historic operations in the area, but that current stormwater and bank erosion pathways may still exist. The City implemented a sampling plan in three outfall basins on the east side of the river between RM 11 and 11.8 (Outfalls 43, 44, and 44A). This is part of a comprehensive source identification effort in the area that DEQ initiated in 2008. DEQ is also working with PacifiCorp to evaluate whether source control measures at their sites in this area will be needed.

2.2 Downtown Portland Willamette River Sediment Investigation

DEQ continues our work with the City of Portland and other partners to investigate sediment quality in the Willamette River upstream of the Portland Harbor in downtown Portland. The results of the initial investigation broadened our understanding of the previously existing limited sediment quality data, and allowed us to gain a better understanding of the nature and extent of hazardous substances in the downtown reach. The first phase of the investigation collected surface sediment and/or cores samples from nearly 80 locations.

The field work for the downtown reach sediment investigation was completed in June 2008. Results from this first phase are compiled in the "*Field and Data Report, Downtown Portland Sediment Characterization*" (GSI, 2009). This report can be viewed at: http://www.deq.state.or.us/lq/cu/nwr/willametteriver.htm

DEQ completed a review of this first phase of the investigation. The results of the review are found in a report entitled "*Downtown Portland Willamette River Sediment Evaluation-Preliminary Identification of Areas of Interest* (DEQ, 2009)." A focused second phase is planned for early 2010. This Phase II sampling will be completed to better prioritize areas for follow-up action, lay the foundation for source identification investigations, and in some cases begin to assess contaminant extent.

The investigation results for both phases will be used to help assess area-wide sediment conditions and identify sources of contamination for sediment.

DEQ will evaluate an anticipated final summary report and recommend the next steps as appropriate to manage contamination found in river sediment and identify any associated uncontrolled sources to the river.

3.0 Evaluating Potential Sources of Contamination to the River

DEQ is investigating or directing source control work at over 60 upland sites in Portland Harbor. Preliminary investigation activities at these sites are designed to determine whether the site is a potential or ongoing source of contamination to the river. These investigations, or "source control evaluations," consider all potential, current and historic contaminant sources and pathways for the contaminants to migrate to the river. Potential pathways include:

- Direct discharges – Pollutants from commercial, industrial, private or municipal outfalls discharged directly to the Portland Harbor Superfund Site. Many of these discharges are permitted (general or individual permits) under the Clean Water Act National Pollutant Discharge Elimination System (NPDES). Permitted discharges include industrial wastes, stormwater runoff, and combined sewer overflows (CSOs)[4].
- Groundwater – Contaminated groundwater may enter the river directly via discharge through sediments, bank seeps, or it may infiltrate into storm drains/pipes, ditches or creeks that discharge to the river. Contaminant migration may occur as non-aqueous phase liquids (NAPLs) or as chemicals dissolved in the groundwater itself.
- Stormwater – Contaminants may be carried to the river by water that runs off a site into storm drains after it rains, delivered to the river by stormwater pipes (including permitted and unpermitted stormwater discharges).

[4] CSO events are untreated discharges of combined stormwater, sanitary sewage from residential, commercial, and industrial sources that overflow from the sewer system into the river during heavy rainfall periods when the amount of stormwater and sewage exceeds the capacity of the collection system.

- Overland transport/sheet flow – The uncontrolled flow of water from a site to the river and the transport of other materials from a site may deliver contaminants to the river.
- Bank erosion/leaching – River bank soil, contaminated fill, waste piles, landfills and surface impoundments may release contaminants directly to the river through erosion, via soil erosion to stormwater, or by leaching to groundwater.
- Overwater activities – Contaminants from overwater activities (e.g., sandblasting, painting, unloading, maintenance, repair and operations) at riverside docks, wharves, or piers; discharges from vessels (e.g., gray, bilge, ballast waters); full releases; and spills may affect the river.

These potential contaminant migration pathways are evaluated for each site, and upland contaminant concentrations are screened against conservative screening level values (SLVs) protective of human health and the environment. Sites that are identified as significant current or potential sources of pollution to the river are characterized and prioritized. Based on the resulting priority, either further source control evaluation is completed or source control measures are initiated.

Table 1 provides a summary of confirmed and suspected upland sources of contamination to the river that DEQ is either actively working on or has finished source control work on by issuing a final source control decision. Table 1 also provides the basis for the determination that a site is a source of contamination to the river, the status of and schedule for source control evaluation, and the priority of the site for source control. The table includes the priority of each contaminant migration pathway for each site, as well as the overall priority of the site based on the pathway priorities.

High priority sites are identified in the table based on existing site information, and subsequent Milestone Reports will identify any new high priority sites as new information becomes available. Source control is expected to move forward at high priority sites without delay.

4.0 Taking Measures to Control Sources and Making Source Control Decisions

DEQ determines the need for source control measures at each upland site, in consultation with EPA, based on the completeness of contaminant migration pathways, exceedances of SLV, and other factors as appropriate. See p. 3-1 through 3-6 of the JSCS for more information about SLVs, and p. 4-1 through 4-10 of the JSCS for more information about the source control decision process.

4.1 Types of source control measures

Upland source control is an iterative process where early steps may be revisited and conclusions refined by information gathered later in the process. A combination of tools may be used to control a source, including but not limited to the following.

- Technical assistance – Technical assistance, often provided during inspections, provides technical information designed to help individual businesses bring their facilities into

compliance with environmental regulations. DEQ's Hazardous Waste Program has and continues to provide technical assistance to facilities within the Portland Harbor Superfund Site area.

- Cleaning-up contaminated upland areas – Cleanup work addresses contaminated soil, groundwater, stormwater and other sources and focuses on reducing or eliminating contaminant migration to the river. Common source control measures include removing highly contaminated soil areas, stabilizing or capping contaminated bank areas, treating or containing contaminated groundwater, and extracting contaminated sediment from storm sewer systems. Source control measures vary from site to site.
- Source control of active discharges – Tools to control active discharges include best management practices (BMPs), industrial process changes, pollution prevention practices, and technology-based effluent controls. Compliance is achieved voluntarily or through administrative actions, including permits or enforcement.
- Source control of stormwater – Stormwater source control is complex because storm drain systems capture discharges from many different sources (e.g., land use activities, runoff from contaminated sites, and infiltration of contaminated groundwater into the storm drain system). Stormwater regulation also involves state and local agencies implementing MS4 and 1200Z general stormwater permits. Because of this complexity, all of the tools described above are useful for stormwater source control and will be used as appropriate.
- Administrative actions and enforcement – Administrative actions include licenses, permits, deed restrictions, requirements for site development plans, and enforcement actions; which may be necessary when administrative actions are violated. Agencies rarely take enforcement actions without first conducting an inspection and documenting findings, requested changes, warnings and offers of technical assistance. When enforcement actions are warranted, they are usually taken in escalating order, starting with notices of violation, moving to enforcement or compliance orders requiring specific changes by a set date, and ending with monetary penalties, court action or DEQ's takeover of investigation or cleanup work. Formal cleanup actions performed under an order or decree use oversight and enforcement to ensure that appropriate actions are taken in a timely manner.

Table 1 summarizes source control decisions conducted at upland sites, the basis for the determination that upland source control measures are necessary, a summary of the selected source control measure(s), and a schedule for implementing the source control measure(s). Figure 1-a-c displays most sites listed in Table 1.

4.2 DEQ coordination with EPA and partners on source control decisions

As the Lead Agency for identifying and controlling sources of upland contamination threatening the river in Portland Harbor, DEQ coordinates with EPA and our government partners on source control work. This includes documenting, tracking and coordinating source control efforts as described in Sections 2.5 and 7 of the JSCS.

DEQ provides EPA and our partners an opportunity to review and comment on source control decisions prior to being finalized. These decisions typically fall into the following three categories.

- DEQ determined that a site is not a current or future significant source of contaminants to Portland Harbor and that no source control measures are required.
- DEQ selected the source control measures for a site.
- DEQ concluded that source control at a site is complete, or in the case of systems that require operation and maintenance (e.g., hydraulic containment), that the source control action is effective.

DEQ informs EPA and our partners of pending source control decisions and the schedule for review, and provides copies of source control decision documentation to EPA and partners upon request. EPA and partners have 30 days to provide comments to DEQ on source control decisions.

In addition to this regular review and comment process, some upland sites in Portland Harbor may warrant closer coordination between DEQ, EPA, and our partners for source control (e.g., the Gasco site and potential source control measures for the chlorinated solvent groundwater plume at the Siltronic site). In these instances, DEQ and EPA source control coordinators will develop project-specific coordination strategies.

4.3 Public involvement in source control decisions

DEQ Cleanup Program statutes and rules require that a public notice and comment opportunity be provided prior to DEQ's selection of a final site cleanup remedy and before DEQ determines that the cleanup is complete. For upland Portland Harbor cleanup projects, this means that DEQ issues a public notice and seeks public comments on the recommended final site cleanup strategy. Once public input is considered, DEQ's final decision is typically documented in a Record of Decision (ROD) for the site. For most sites, the upland DEQ ROD includes elements that address both source control for Portland Harbor and cleanup actions specific to areas of upland contamination that are not related to pollution in the Harbor.

Many of the source control measures implemented at upland sites are conducted prior to the selection of the final upland site-wide remedy. While public notice and comment is not required for these "interim" removal actions under DEQ statutes and rules, DEQ typically issues a public notice and seeks public comments when the action is likely to be a substantive piece of the final site remedy, or as the DEQ project manager determines is appropriate.

DEQ does not typically seek public comments for small-scale interim source control measures and time critical actions. Project managers will, however, issue notices as appropriate to let the public know that the activity is being conducted.

5.0 Status of Ongoing and Completed Source Control Activities

Table 1 summarizes the status of ongoing source control activities; including source control evaluations (SCEs), source control decisions (SCDs), and source control measures (SCMs).

Table 1 also provides information on source control activities completed to date, proposed SCM activities, and a target schedule for completion.

Table 1 also summarizes completed SCMs and provides the date that the SCM was completed, the date of EPA review and comment, and any operation and maintenance requirements associated with the SCM.

As of December 2009, the DEQ categorized 84 sites (see Table 1) into the following source control categories:

High Priority Sites- 9
Preliminary High Priority Sites- 7
Medium Priority Sites- 16
Low Priority Sites- 21
Priority "To Be Determined" Sites- 8
Sites with Source Control Decisions- 23

The status of High Priority and Preliminary High Priority sites is presented in Table 2. Twelve of the 16 High Priority sites currently have at least interim SCMs in place. Some of the more important actions in-place or anticipated at the High Priority sites include:

-**Evraz Oregon Steel Mills**- Two separate source control efforts are moving forward at the EOSM site. 1st, stormwater is being addressed through a combination of best management practices and end-of-pipe treatment. Phase I of the end-of-pipe treatment, addressing stormwater flow to the northern facility outfall, was installed in 2007 and underwent pilot testing in 2007/2008. Based on the results of the pilot test, the system was expanded to capture stormwater flow going to the central facility outfall. A Phase II pilot study was conducted in 2009. EOSM will conduct a loading evaluation in 2010 to assess contaminant releases to the Willamette River via stormwater, and determine if any further stormwater source control action is necessary. 2nd, riverbank treatment source control measures are in re-design largely to resolve stakeholder concerns regarding mitigation, habitat conservation and restoration, and to incorporate bioengineering components. EOSM plans to re-submit their 404 Permit application in 1st quarter 2010, re-engage natural resource trustee stakeholders in the new design, and construct the riverbank source control measure in 2011 or 2012.

-**Schnitzer Steel**- Schnitzer Steel proposed a stormwater management plan in fall 2008. The plan will provide comprehensive management of stormwater including both re-use as on-site process water and end-of-pipe treatment. Phase 1A of the plan calls for abandoning a number of stormwater outfalls, collecting stormwater from most of the site, routing the stormwater thru screen filters to a storage tank, and then either re-using the water or discharging the water under an NPDES permit. Phase 1A was completed late 2009. Phase 1B consists of paving the Phase 1A construction area. Phase 2 will capture stormwater from several additional on-site drainage basins and route the stormwater to the new filtration and storage system. Phase 2 stormwater improvements are expected to be constructed in fall 2010.

-**Arco/BP**- A new permanent seawall sheetpile wall was installed in summer 2007. The sheetpile wall will enhance existing hydraulic control of contaminated groundwater. A

riverbank soil and near-shore sediment removal and capping completed in fall 2008. Approximately 16,000 cubic yards (cy) of petroleum-contaminated soil/sediment were removed and shipped offsite for disposal. The project was completed in summer 2009 by removing the in-river temporary sheetpile wall, final site grading, and planting.

-**Gasco**- An amended Focused Feasibility Study (FFS) was submitted November 2007 for a groundwater and non-aqueous phase liquid (NAPL) SCM. DEQ accepted NW Natural's recommendation for a vertical barrier wall/extraction wells system as the SCM. NW Natural submitted an Interim Design Report to DEQ in 11/09. SCM construction is scheduled to begin in late 2010.

-**Siltronic**- An amended FFS was submitted December 2007 recommending an enhanced in-situ bioremediation (EIB) SCM for the Siltronic chlorinated solvent groundwater plume. DEQ selected EIB to be applied in the release area. Siltronic completed application of EIB in the source area in summer 2008, has recently expanded the EIB application area, and is currently monitoring results from the SCM.

-**Arkema**- Arkema is working on three separate upland source control efforts at their site. 1st, Arkema submitted an FFS for groundwater/NAPL in summer 2008. DEQ selected a slurry wall/groundwater extraction system as the SCM in 2009, and the SCM is in design. We anticipate SCM construction to begin in 2010. 2nd, Arkema submitted a stormwater FFS in summer 2008, DEQ selected a stormwater SCM earlier this year and the SCM is in design and permitting. The stormwater SCM will consist of berming the perimeter of the site to prevent off-site overland flow, temporarily capping higher-level contaminated soil, abandoning 3 existing outfalls, installing a new collection/conveyance system, conveying the stormwater to a detention pond to reduce suspended load, and discharging the stormwater thru a sand/carbon filter under an NPDES permit. Stormwater SCM construction is expected to begin in 2010 and conclude in 2011. 3rd, Arkema evaluated their riverbank and the threat that portion of the site poses to the river. Riverbank source control will likely be incorporated into the EPA-lead in-water Early Action at Arkema. Arkema will evaluate riverbank SCM options in 2009-10.

-**Rhone-Poulenc**- The responsible party at Rhone Poulenc, SLLI, is working on three major upland source control/evaluation efforts at their site. 1st, SLLI submitted a comprehensive SCE report in early-2008, DEQ reviewed the report, SLLI will revise the report after collecting significant additional hydrogeologic information to inform the conceptual site model, and submit the revised report in mid-2010. 2nd, SLLI pilot tested several SCMs to treat and/or control their most significant groundwater plume threatening the river. SLLI is currently conducting an extensive, long-term groundwater pumping test to support the design of their North Front Avenue SCM which targets contaminated groundwater moving in the highly conductive deep gravel zone. The pumping test includes a number of extraction wells that could largely comprise the SCM. The pumping test should conclude in late 2010. Construction of any supplemental portions of the SCM are anticipated for early 2011. 3rd, SLLI removed accumulated sediment from Outfall 22B stormwater lines and grouted the lines to at least partially prevent contaminated groundwater from invading the lines. In the second half of 2009, SLLI cleaned out the lines and installed impermeable liners in the stormwater lines to further prevent groundwater invasion. In addition to these three ongoing source control efforts, SLLI: 1) spent two field seasons removing drums and debris from the Doane Lake area, 2)

completed an on-site Facility Structures Interim Remedial Action Measure (IRAM); and 3) completed the Groundwater Extraction and Treatment System (GETS IRAM) in 2005 designed to capture alluvial zone groundwater in the Herbicide Area.

DEQ developed five specific goals for our source control efforts. These goals will track DEQ source control efforts to achieve the overarching goal of source control: to identify, evaluate and control sources of contamination that may affect the Willamette River in coordination with the objectives and schedule for the Portland Harbor RI/FS.

The goals described below are aggressive goals that were based on an anticipated ROD date of 2010. While much progress has been made to reach these goals, some remain outstanding. Some of the reasons these goals have not been achieved include the complexity of the work, work load for both DEQ and upland responsible parties, and obstacles in implementing the work. While all the goals have not been met, DEQ believes these sites remain on-track to achieve source control at the High Priority sites by the time of the Portland Harbor ROD. The Portland Harbor ROD is now anticipated to be completed in late-2012. Dates for the goals below have been adjusted to better reflect the current status and the new anticipated ROD date.

Goals and Status for High Priority Sites

Goal 1- Source Control Evaluations (SCE) completed at all High Priority sites by 1/1/10.

Goal 1 Status as of 12/09

-2 of 16 SCEs completed

-2 of 16 SCEs currently under review by DEQ, to be completed in 2010

-5 of 16 SCEs to be completed in 2010

-Of the 7 remaining High Priority sites (16 minus 9) that are either not completed or are not on schedule to be completed by 1/1/10, stormwater is the only outstanding pathway to be completed in 5 of the 7 sites.

Goal 2- SCMs selected at all High Priority sites by 7/1/10.

Goal 2 Status as of 12/09

-Interim or final SCMs have been selected and have been implemented at 12 of 16 sites. These sites include: 1) Oregon Steel Mills (stormwater), 2) Schnitzer Steel (stormwater), 3) Kinder Morgan Linnton (groundwater), 4) Exxon/Mobil (groundwater), 5) Arco/BP (groundwater and riverbank/beach), 6) MarCom South (overland runoff), 7) Siltronic (groundwater), 8) Rhone Poulenc (groundwater and stormwater), 9) Arkema (groundwater), 10) Willbridge (groundwater), 11) Gunderson (groundwater), and 12) City Stormwater (line cleanouts).

-Selection of SCMs at other High Priority sites is anticipated over the next 6-12 months. For instance, 1) DEQ selected a significant SCM at the Gasco site in March 2008. NW Natural completed a series of field efforts designed to support the detailed design of this SCM, a vertical barrier wall/groundwater extraction well system. The Gasco groundwater/NAPL SCM is now in design with construction scheduled to begin in 2010…., 2) EOSM has further characterized the nature and extent of riverbank contamination, produced initial designs, and has been in negotiation with the Corps and natural resource trustees for the construction of riverbank treatment SCM at their facility. Construction of that

river bank SCM is expected to begin in 2011 or 2012…., 3) late 2009 construction of an end-of-pipe stormwater filtration, storage and reuse at the Schnitzer Steel site…., 4) NW Natural recently completed a series of studies developed to support the detailed design of their groundwater/NAPL SCM at the Gasco facility. DEQ received NW Natural's Interim design report for the SCM in 11/09. SCM construction is scheduled to begin in late 2010…., 5) DEQ recently selected a vertical barrier wall/groundwater extraction wells system as a groundwater/NAPL SCM for the Arkema site. The SCM is currently in design and construction is scheduled to begin in 2010. DEQ also recently selected a stormwater SCM for the Arkema site. The stormwater SCM is currently in design and construction is expected to begin in 2010 and conclude in 2011.

Goal 3- SCMs constructed and effectively operating at all High Priority sites by 1/1/12.

Goal 3 Status as of 12/09

-5 of 16 sites have effective groundwater SCMs operating. These 5 sites include: 1) **Exxon/Mobil, 2) Gunderson, 3) Willbridge, 4) Arco/BP, and 5) Siltronic.**

Goals and Status for Medium and Low Priority Sites

Goal 4- SCE completed at all Medium and Low Priority sites by 1/1/11

Goal 4 Status as of 12/09

-While none of the 16 Medium Priority sites currently have completed SCEs, 13 of the 16 sites are on schedule to be completed in 2010. While none of the Low Priority sites currently have completed SCEs, 19 of the 21 sites are on schedule to be completed in 2010.

Goals and Status for Priority "To Be Determined (TBD)" Sites

Goal 5- Completed prioritization at all TBD sites by 1/1/10.

Goal 5 Status as of 12/09

-2 of the 8 sites are EPA-lead sites (Vanwaters-&-Rogers & US Moorings).

-7 non-EPA-lead TBD sites are left to be prioritized and they are scheduled to be prioritized in early 2010.

6.0 Issues Encountered in Source Control Work

This section summarizes issues affecting DEQ's completion of source control work. This section also presents the steps DEQ is taking to resolve the issues and complete source control work.

Issue 1: Moving projects through the source control process

Certain DEQ Portland Harbor cleanup projects are not proceeding through the source control process at an acceptable pace. There are a number of reasons for the lack of adequate progress at these sites, including: complexity of the site, limited DEQ staff resources, uncertainty regarding liability/responsibility for the needed environmental work, reluctance of the responsible party to move forward, and economic strains on many of the responsible parties. Source control activities at these sites need to be accelerated in order to identify, evaluate and control upland contaminant sources before the Portland Harbor ROD. Moving High Priority sites forward has been an

ongoing issue for DEQ. We are focusing our attention on these sites and working with the upland responsible parties to move these projects forward. Two of these sites include:

- **Burgard Industrial Park**
  Problem: At one time, Schnitzer Investment Corporation (SIC) owned the roughly 200-acre Burgard Industrial Park (BIP) that partially surrounds the International Terminals Slip at River Mile (RM) 4. A number of tenants leased properties in BIP. Approximately 93 of the 200 acres are leased to Schnitzer Steel for their scrap metal recycling yard and marine terminal. SIC entered into a DEQ Voluntary Agreement in 2000 to perform a remedial investigation and source control measures for BIP. Since signing the agreement, DEQ and SIC have focused on the Schnitzer Steel portion of the BIP. Over the past several years, SIC has sold much of the BIP, and now currently only owns 21.5 acres of BIP outside of the 93-acre Schnitzer Steel site. DEQ recently requested SIC conduct SCE in BIP outside the Schnitzer Steel site. SIC recently declined our request stating that since SIC didn't have access rights to the property they sold, and SIC would not be able to perform SCE for the portions which have been sold.
  Path to resolving: DEQ believes SIC is still responsible for SCE efforts in the reminder of BIP, and will work with SIC to complete at SCE in BIP.
- **GS Roofing**
  Problem: The DEQ project manger overseeing work at GS Roofing left DEQ in 2007, and the vacant position was not filled in a timely manner due to agency budget constraints. This has affected the progress of source control work at the site.
  Path to Resolving: DEQ made GS Roofing site a priority for staffing and accelerated source control work. GS Roofing conducted independent investigations of the facility. The next step in the project is for DEQ to review this information and provide direction regarding what additional work is required and a schedule for this work.
  Progress made since April 2009 Milestone Report: DEQ assigned a new project team to the GS Roofing site in early 2009. The responsible party is currently completing a stormwater investigation, and is developing a scope of work for the remaining elements of a comprehensive SCE.

Issue 2: Completing source control at the Gasco site

NW Natural's Gasco site (which includes NW Natural's manufactured gas plant contamination on the Siltronic site) is a High Priority site for upland source control. The distribution and magnitude of upland contamination at the Gasco site is extensive and very significant. DEQ directed NW Natural to collect data to support the selection, design, installation and operation of source control measures, rather than conducting further source control evaluation. NW Natural and DEQ agreed to a schedule for a phased approach to design and implementation of source control measures. While the actual construction of the SCM has been delayed until 2010, NW Natural continues to move forward with recent work that supports source control planning and design along the shoreline of the Gasco and Siltronic properties

Issue 3: Completing source control at the Arkema site

As stated in Section 5, Arkema is working on three separate upland source control efforts at their site. 1st, Arkema submitted an FFS for groundwater/NAPL in summer 2008. DEQ selected a slurry wall/groundwater extraction system as the SCM in 2009, and the SCM is in design. We

anticipate SCM construction to begin in 2010. 2nd, Arkema submitted a stormwater FFS in summer 2008, DEQ selected a stormwater SCM earlier this year and the SCM is in design and permitting. The stormwater SCM will consist of berming the perimeter of the site to prevent off-site overland flow, temporarily capping higher-level contaminated soil, abandoning 3 existing outfalls, installing a new collection/conveyance system, conveying the stormwater to a detention pond to reduce suspended load, and discharging the stormwater thru a sand/carbon filter under an NPDES permit. Stormwater SCM construction is expected to begin in 2010 and conclude in 2011. 3rd, Arkema evaluated their riverbank and the threat that portion of the site poses to the river. Riverbank source control will likely be incorporated into the EPA-lead in-water Early Action at Arkema. Arkema will evaluate riverbank SCM options in 2009-10.

Issue 4: DEQ staff resource limitations

Limited staff resources have affected DEQ's ability to conduct and complete source control work in Portland Harbor. Over the last 2.5 years DEQ hired four new project managers to work on Portland Harbor projects and other projects. Last year we also hired a DEQ Cleanup Program GIS Coordinator to help with both state-wide and Portland Harbor needs, and hired an experienced Project Manager to manage the Gunderson project.

DEQ is continually looking at staff work load and developing priorities to address the most important work. DEQ will continue Portland Harbor source control efforts focusing on the most significant and potentially significant upland sources.

Issue 5: Stormwater evaluation and control

Stormwater pathway evaluations are a relatively new and evolving effort for DEQ's Cleanup Program, and two recent developments demonstrate the considerable progress made as a result of the Portland Harbor investigations.

In December 2009, DEQ issued a revision to Appendix C of our *Guidance for Evaluating the Stormwater Pathway at Upland Sites*. Appendix C provides guidance to Responsible Parties on how to put together a stormwater pathway evaluation report. The revised guidance provides much more explicit guidance on how to construct a "weight of evidence" determination. Ultimately, the determination depends on demonstrating that the following criteria have been met:

1. Existing and potential facility-related contaminant sources have been identified and characterized;
2. Contaminant sources are being controlled to the extent feasible; and
3. Adequate measures are in place to ensure source control and good stormwater management measures occur in the future.

The revised guidance is available on DEQ's Portland Harbor website at:
http://www.deq.state.or.us/lq/cu/stmwtrguidance.htm

One of the challenges in conducting stormwater pathway evaluations is that little was known about the types and concentrations of contaminants that are commonly found in industrial stormwater. Because of this, it was not clear whether exceedances of JSCS SLVs in stormwater

were an indication of contamination on the site or was simply the signature of "normal" industrial operations. This distinction is important because it dictates the type of response warranted at the site. In general, stormwater discharges related to "normal' industrial operations are managed with stormwater Best Management Practices and, where appropriate, are regulated under Water Quality permits. Contaminated sites are investigated and addressed according to Cleanup Program regulations.

Now that there is a sizeable stormwater dataset from Portland Harbor sites, it may be possible to begin to determine what's "normal" and what's not. DEQ is beginning to evaluate the Portland Harbor stormwater data which includes data collected from individual upland Portland Harbor sites and data collected by the LWG in support of the in-water Remedial Investigations, to see how it can be used to help make stormwater source control decisions. The early results look promising, and DEQ expects to be sharing more about these efforts with interested parties in the first quarter of 2010.

7.0 Summary

DEQ is making significant progress in controlling sources of contamination to the lower Willamette River in Portland Harbor, and is coordinating resources of its Cleanup, Hazardous and Solid Waste, Water Quality and Spills Programs to achieve upland source control objectives by the expected time of the Portland Harbor Record of Decision or shortly after. To date, DEQ has identified more than 80 upland sites that may be potential sources of contaminants in Portland Harbor, and most of these sites have been prioritized for additional investigation or source control. Additionally, DEQ evaluated a number of sites in our site discovery process throughout the Portland Harbor project and concluded these sites do not threaten the river.

As of December 2009, the DEQ categorized 84 sites (see Table 1) into the following source control categories:

High Priority Sites- 9
Preliminary High Priority Sites- 7
Medium Priority Sites- 16
Low Priority Sites- 21
Priority To Be Determined Sites- 8
Sites with Source Control Decisions- 23

DEQ will submit a Milestone Report to EPA twice a year, with the next Milestone Report scheduled for June 2010, and update Table 1 and Table 2 with the current status of source control work at all upland sites. For more information about the Milestone Report or DEQ's source control work generally, please contact Jim Anderson, DEQ Portland Harbor Project Manager, at (503) 229-6825, or anderson.jim@deq.state.or.us.

8.0 Obtaining Additional Information on Upland Source Control Work

For more information on DEQ's source control work at any of the sites listed in Table 1, see DEQ's Portland Harbor web page (http://www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/index.htm) and click on "Upland Sites map" in the right hand corner. This link provides a map showing all Portland Harbor upland sites and summary reports of the status of source control work. Just open the map and click on the site you are interested in to connect to DEQ's Environmental Cleanup Site Information (ESCI) database, which houses current information on work at each site.

Alternatively, contact the DEQ project manager (PM) that is leading work on the site you are interested in. Contact information for each DEQ PM is listed on the last page of this report.

For more information on the status work on the Portland Harbor Superfund Site, see EPA's Portland Harbor web page (http://yosemite.epa.gov/r10/cleanup.nsf/sites/ptldharbor).

9.0 Information about Table 1: Controlling Confirmed or Suspected Upland Sources of Contamination to Portland Harbor

The purpose of Table 1, entitled Controlling Confirmed or Suspected Upland Sources of Contamination to Portland Harbor, is to track and share information on the status of DEQ's efforts to evaluate and control sources of pollution to the Willamette River in Portland Harbor. The table provides information on each upland site that DEQ is working on in the Harbor, including the status of evaluations to determine whether source control is needed, the progress of source control measures, and the status of source control decisions and EPA review. Below is some helpful information for interpreting the table, including definitions for key terms and acronyms.

Site Information and Project Status

The first columns of Table 1 provide basic background information on each site, including:

- the name of the site,
- the site's reference number for DEQ's Environmental Cleanup Site Information (ESCI) database,
- the location of the site (river mile and address),
- the DEQ project manager that is leading source control work,
- the type of agreement DEQ is using to direct cleanup activities at the site (i.e., Intergovernmental Agreement, Portland Harbor Agreement, Unilateral Order, etc.), and
- the status of work occurring at the site (i.e., Preliminary Assessment, Remedial Investigation, completed Source Control Decision, Remedial Design/Remedial Action, etc.).

Sites are listed in Table 1 based on their position alongside the Willamette River, or the "River Mile" associated with their location. The River Mile indicates distance of the site from the Willamette River's confluence with the Columbia River. Sites associated with a lower river mile occur downstream of sites with a higher river mile.

Sites listed in Table 1 are those in Portland Harbor at which DEQ is actively overseeing upland investigation or source control actions, or for which source control decisions have been made. DEQ updates the site information in ECSI when a Strategy Recommendation is made, but a site is not added to Table 1 until active oversight of the project is provided by DEQ.

Source Control Evaluation

The Source Control Evaluation (SCE) columns in Table 1 provide information on the status of DEQ's work to evaluate the need for source control measures, including the status of SCE for each potential pathway, the schedule for completing SCE, the basis for determining whether source control measures are needed, and the status of EPA review.

Potential pathways
Six standard pathways represent the major potential pathways that contaminants could follow to reach the river from an upland site. These pathways include:

- overland transport/sheet flow – the uncontrolled flow of water and other material to the river from a site
- back erosion – erosion of material within the sloping bank areas of the site to the river
- groundwater – groundwater plumes or discharges to the river via seeps or through preferential pathways
- stormwater – stormwater discharges to the river that originate from a pipe or stormwater system, including unpermitted stormwater discharges and discharges under a DEQ general stormwater permit
- overwater activities – the storage or use of hazardous substances over the water (i.e., storage tanks on docks, permanent work activities conducted over water), that if released would be a potential current or future source of contamination to the river; pipelines and other conveyance systems are not considered in this category, releases from these types of systems are reported to the Oregon Emergency Response System (OERS) system for clean up
- other – may include permitted wastewater discharges, individually permitted stormwater discharges, air deposition or other pathways

Each of these standard pathways appears for each site in Table 1 to track SCE work on a pathway-specific basis.

Basis for determining the need for source control
DEQ evaluates each of the pathways listed above to determine the need for source control measures. DEQ makes this determination based on: (1) whether contaminants are present and whether the pathway is capable of carrying them to the river (if it is, the pathway is called "complete"); and if a complete pathway exists, (2) whether it is carrying contaminants to the river at concentrations that exceed the Screening Level Values (SLVs) provided in the Joint Source Control Strategy (JSCS)[5].

Three general examples are provided below.

[5] See p. 3-1 through 3-6 of the JSCS for more information about SLVs.

- Example 1: Initial investigations of a site that is adjacent to the river indicate that bank soils have the potential to erode and carrying contaminants into the river. DEQ oversees a SCE to determine whether contaminants are in fact present in the bank soils and whether the eroded bank soils are carrying or could carry those contaminants into the river. The SCE concludes that contaminants are present in the bank soils and the soils are carrying contaminants into the river; the pathway is deemed "complete." The SCE then determines whether the bank soils are carrying or could carry contaminants to the river at concentrations that exceed the SLVs in the JSCS. If they are or could carry contaminants to the river at concentrations exceeding SLVs, DEQ determines that source control measures may be needed and assigns a priority of high or medium to the pathway based on the degree of SLV exceedance (see "Priority levels for each pathway and site" below for more information on the priority levels). If it is a high priority, then the RP should move forward aggressively evaluating, designing, and implementing SCMs. If it is medium priority, then the RP should use the weight-of-evidence approach to determine if further SCE is needed or if SCMs are needed.
- Example 2: Initial investigations of a site adjacent to the river indicate that groundwater has the potential to migrate toward the river and carry contaminants. DEQ oversees a SCE to determine whether contaminants are present in the groundwater and whether the groundwater is carrying or could carry those contaminants into the river. The SCE concludes that groundwater is or could carry contaminants into the river, but only at concentrations significantly below the SLVs listed in the JSCS. DEQ determines that the pathway is "complete," but no source control actions are needed because SLVs are not exceeded.
- Example 3: Initial investigations of a site near (but not adjacent to) the river indicate that stormwater has the potential to migrate toward the river and carry contaminants. DEQ oversees a SCE to determine whether stormwater is in fact migrating to the river and whether it is or could carry contaminants to the river. The SCE concludes that stormwater is actually not reaching the river and could not reach the river because it is diverted to a stormwater treatment system. DEQ determines that the pathway is "not complete" and no source control actions are needed.

Definition of "Insignificant pathway; no actions recommended"

The term "insignificant pathway; no actions recommended," is used in Table 1 when (1) the pathway is complete, and (2) contaminant concentrations are near or below SLVs at a point of compliance (e.g., river bank monitoring wells) and are not anticipated to increase.

Use of "N/A" for the pathways

"N/A" is used in Table 1 to indicate that the particular pathway does not exist at the site. For example, for an upland site that is set back from the river (i.e., not adjacent to the river's edge) N/A would indicate that the overland transport/sheet flow, overwater activities, and bank erosion pathways do not exist at the site. For a site that is adjacent to the river, but where a concrete seawall lines the river bank, N/A would indicate that the pathway bank erosion does not exist at the site.

Priority levels for each pathway and site

Each pathway evaluated at each site is given a priority level for source control upon completion of the SCE, or when adequate information exists to determine the pathway's priority. Pathways are prioritized based on their ability to carry contaminants from upland areas to the river at concentrations that exceed SLVs. Each site is then given a priority level based on the highest priority of the pathways. For example, if a site has two low priority pathways and one high priority pathway, the site is determined to be a high priority for source control. Definitions for high, medium and low priority determinations follow.

- High – High priority pathways and sites are those where a complete contaminant migration pathway exists and the upland source is significantly impacting the river or poses a significant and imminent threat to the river based on initial evaluation of key source control prioritization factors (listed on p. 4-3 of the JSCS). A primary consideration is that one or more media (soil, groundwater or stormwater) significantly exceed applicable SLVs at the point of discharge to the river (e.g., water at the end of a discharge pipe or soil or material at the riverbank) or the most reliable and cost-effective data point (e.g., groundwater measured at the shoreline), or where a bioaccumulative chemical is detected at concentrations significantly above the SLV. In addition, if an upland source is violating DEQ narrative water quality criteria for the Willamette River, the site may be considered a high priority. High priority sites are expected to move forward with aggressive source control measures without delay or be subject to enforcement action.
- Medium – Medium priority pathways and sites are those where a complete contaminant migration pathway exists and the upland source is impacting the river or poses a significant and/or imminent threat to the river based on an initial evaluation of key source control prioritization factors (listed on p. 4-3 of the JSCS). A primary consideration is that one or more media exceed applicable SLVs, but not significantly, at the point of discharge to the river, or where a bioaccumulative chemical is detected at concentrations above the SLV. Although exceedance of SLVs does not necessarily indicate that a site poses a significant and/or imminent threat or needs to immediately implement source control measures, it does indicate that the site may pose a threat to human health or the environment and that additional evaluation may be needed to determine if source control measures are required to prevent, minimize or mitigate the migration of hazardous substances to the river. If the site exceeds one or more SLVs, the need for further characterization or for implementation of source control measures will be based on a site-specific weight-of-evidence determination. Medium priority sites are expected to perform a weight-of-evidence evaluation to determine if source control measures are required (see p. 4-5 of the JSCS for more information on the weight-of-evidence evaluation).
- Low – Low priority pathways and sites are those where upland data indicate, based on an initial evaluation of key source control prioritization factors (listed on p. 4-3 JSCS), that the site likely poses a low threat to the river (e.g., concentrations are near or below SLVs) or where DEQ, in consultation with EPA, may issue an upland "No Further Action" (NFA) determination or lower the State's priority of the site for further upland investigation or remedial action under DEQ's cleanup authority. Source control measures will not be required at low priority sites unless determined necessary by the results of the Portland Harbor RIFS or ROD.

- p High – DEQ's preliminary determination is that this is likely a high priority pathway or site based on available information. A final determination of pathway or site priority will be made upon completion of the SCE.
- p Med – DEQ's preliminary determination is that this is likely a medium priority pathway or site based on available information. A final determination of pathway or site priority will be made upon completion of the SCE.
- p Low – DEQ's preliminary determination is that this is likely a low priority pathway or site based on available information. A final determination of pathway or site priority will be made upon completion of the SCE.

Source Control Decisions and Status of Source Control Measures

The Source Control Decisions (SCDs) and Status of Source Control Measures (SCMs) columns in Table 1 provide information on actions taken or needed to control sources of contamination to the river, including the selected SCMs for each pathway, status of SCM implementation, status of EPA review, and ongoing operation and maintenance requirements.

For many sites listed in Table 1, boxes for information on SCDs and SCMs will be blank because source control work at those sites is still in the evaluation (SCE) phase. Other sites may be in the process of implementing SCMs, and still others may have completed all source control work. For those sites that have completed upland source control and SCMs have been determined to be effective, shading indicates that work is finished at this point in time. Upon completion of the Portland Harbor in-water RIFS, however, DEQ will reevaluate all source control work to ensure that it adequate controlled contaminants to the final cleanup levels developed for the Harbor.

9.1 Acronyms and abbreviations

Agr	Agreement
AOC	Administrative Order on Consent
AS/SVE	Air sparge/soil vapor extraction – a Source Control Measure used to remove volatile contaminants from groundwater; often combined with treatment measures
AST	Above ground Storage Tank
AWQC	Ambient Water Quality Criteria
BMPs	Best Management Practices
BRA	Baseline Risk Assessment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COI	Contaminant of Interest – chemicals present in Portland Harbor at levels that could threaten human health and the environment
CSOs	Combined Sewer Overflows
cy	Cubic Yard
DEQ	Oregon Department of Environmental Quality
ECSI	DEQ’s Environmental Cleanup Site Information database
EIB	Enhanced In-situ Bioremediation

EPA	Environmental Protection Agency
FS	Feasibility Study – a phase of the cleanup process; evaluating cleanup alternatives after the Remedial Investigation has been completed
FFS	Focused Feasibility Study
GW or gw	Groundwater
ICP	Independent Cleanup Pathway
IGA	Inter-Governmental Agreement
IRAM	Interim Remedial Action Measure
HVOCs	Halogenated Volatile Organic Compounds
IRAM	Interim Remedial Action Measure
JSCS	Joint Source Control Strategy – issued by DEQ and EPA in December 2005[6]
LNAPL	Low density Non-Aqueous Phase Liquid
LWG	Lower Willamette Group
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer System
N/A	Not Applicable – used in Table 1 to indicate that the particular pathway does not exist at the site
NAPL	Non-Aqueous Phase Liquid
N&E	Nature and extent of the contamination at the site
NFA	No Further Action – a DEQ notice to a Responsible Party declaring that no further cleanup action is needed at the site
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
OF	Outfall
p&t	Pump & Treat system – a Source Control Measure used to remove or contain and treat contaminated groundwater
PA	Preliminary Assessment – an early assessment stage of the cleanup process
PCB	Polychlorinated Biphenyls
PH	Portland Harbor
PH Agr	Portland Harbor Agreement – a formal agreement to conduct the remedial investigation and source control work
PH Ltr Agr	Portland Harbor Letter Agreement – an initial agreement to conduct limited investigation and cleanup activities and cover DEQ's oversight costs
PM	DEQ Project Manager leading cleanup work at the site
PPA	Prospective Purchaser Agreement – a tool for negotiating and agreeing upon potential liability for prospective purchasers of sites
PRP	Potentially Responsible Party
ROD	Record of Decision
RD/RA	Remedial Design/Remedial Action – a phase of the cleanup process that occurs after the Record of Decision; designing and implementing the cleanup action

[6] The JSCS is available on DEQ's web site at (http://www.deq.state.or.us/lq/cu/nwr/PortlandHarbor/index.htm); click "Joint Source Control Strategy" on the left side bar.

RI	Remedial Investigation – a phase of the cleanup process; investigating the nature and extent of contamination and understanding the potential risks posed by the contaminants to human health and the environment
RI/FS	Remedial Investigation/Feasibility Study
RM	River Mile
RP	Responsible Party
SC	Source Control
SCD	Source Control Decision
SCE	Source Control Evaluation
SCM	Source Control Measure
SLV	Screening Level Value – a contaminant-specific level established in the JSCS (see JSCS Table 3.1) that is used to screen upland pathways and sites to identify potential threats to human health and the environment.
SOW	Scope of Work
SVE	Soil Vapor Extraction – a Source Control Measure used to remove volatile contaminants from subsurface soils; often combined with soil vapor treatment
TBD	To Be Determined
TCA	Trichloroethane
UIC	Underground Injection Control system
UST	Underground Storage Tank
VCP	Voluntary Cleanup Program
VOCs	Volatile Organic Compounds
WO	Waiting on
XPA	Expanded Preliminary Assessment – an early assessment stage of the cleanup process

9.2 Contact information for DEQ Project Managers

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